Loss of punching capacity of bridge deck slabs from crack damage

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Abstract: Field observation of punching-type failures of deck slabs in girder-slab bridges that were repetitively subjected to overweight vehicles has led to a study of punching of reinforced concrete slabs with the object of observing the detrimental influence of crack damage, if any, on the punching resistance. Crack damage, geometrically modeled as a flaw, was introduced in the test panels by embedding metallic inserts in the shape of conical frustrums. It has been observed that the punching capacity is impaired by the flaw if the geometrical configuration of the flaw bears a critical orientation with regard to the load.